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Challenges associated with LCA and the chapter Materials

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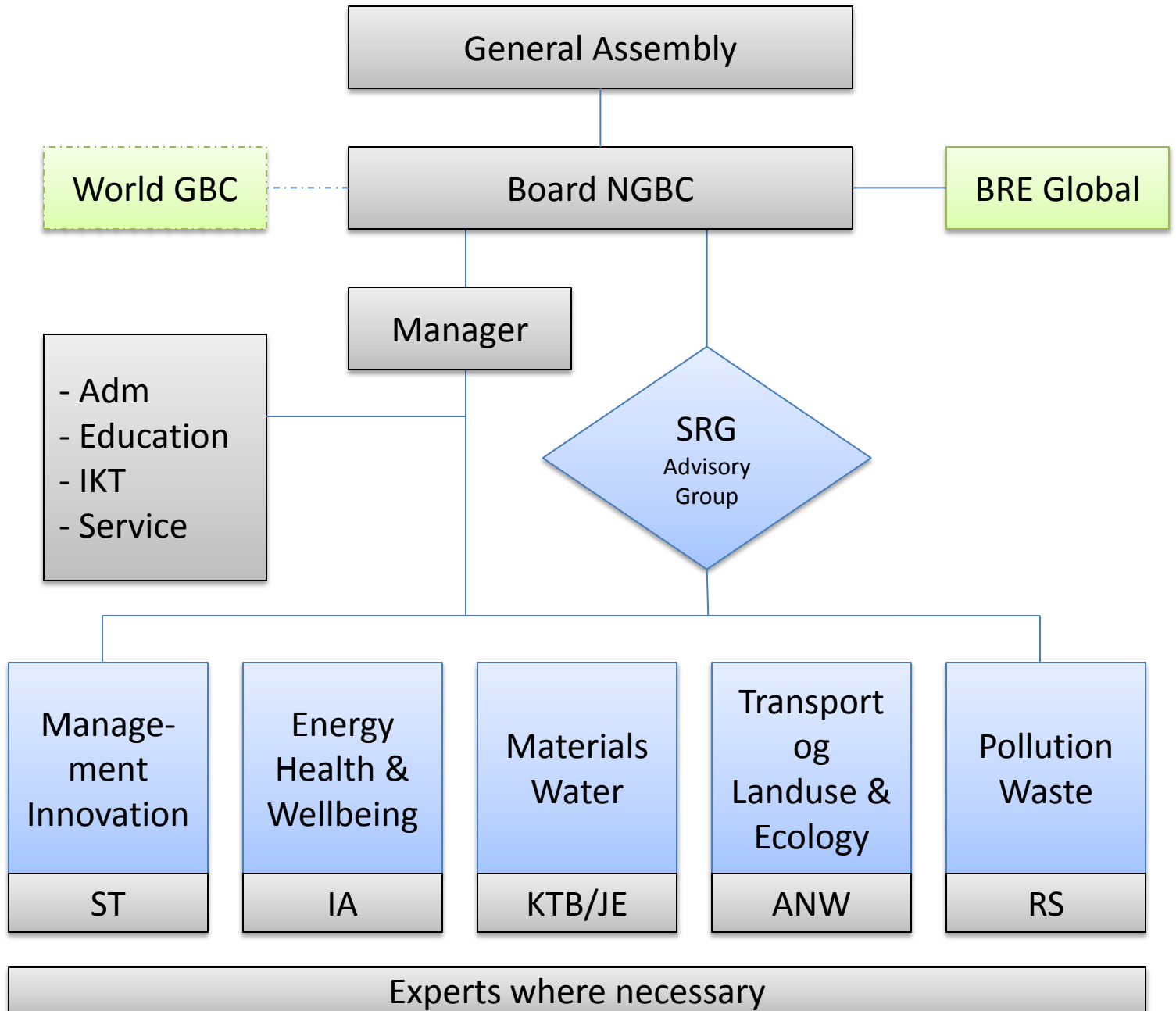
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- A number of GBCs are adapting BREEAM into their own national environmental assessment method
- Leading to a tool that is:
 - Nationally recognised and endorsed
 - Appropriate and tailored to the local context and conditions
 - Consistent with other international standards and assessment tools
 - Available in the local language
- Advantages:
 - Benefiting from BRE's knowledge and expertise
 - Best practice sharing
 - Less resources required

Technical adaptation process

- General structure of the **methodology** to remain the same
- Review **relevance** of the core issues:
 - Based on local knowledge and expertise
 - Based on BRE's experience
- Review **national** environmental issues:
 - Any issues missing? No more than 5% to be added
 - Any issue not adequately assessed?
- **Alternative** compliance requirements sourced:
 - Internationally recognised standards already available
 - Local best practice guidance where possible



Technical adaptation process

- **Adaptation** of the compliance requirements where necessary:
 - National best practice guidance
 - Alternative assessment methodologies (e.g. energy/materials)
- Review **benchmarks/thresholds**
 - Are they too high/too low?
 - Anything already part of the Building Regulations should be removed
- Review **weightings**
 - Local adaptation factors to be identified



WEIGHTINGS IN BREEAM INTERNATIONAL

Table 3 BREEAM 2009 environmental weightings

BREEAM Section	Weighting (%)	
	New builds, extensions & major refurbishments	Building fit-out only
Management	12	13
Health & Wellbeing	15	17
Energy	19	21
Transport	8	9
Water	6	7
Materials	12.5	14
Waste	7.5	8
Land Use & Ecology	10	N/A
Pollution	10	11
Innovation	10	10

BREEAM.NL has chosen the same weighting

Table 6 Example BREEAM score and rating calculation

BREEAM Section	Credits Achieved	Credits Available	% of Credits Achieved	Section Weighting	Section score
Management	7	10	70%	0.12	8.40%
Health & Wellbeing	11	14	79%	0.15	11.79 %
Energy	10	21	48%	0.19	9.05%
Transport	5	10	50%	0.08	4.00%
Water	4	6	67%	0.06	4.00%
Materials	6	12	50%	0.125	8.25%
Waste	3	7	43%	0.075	3.21%
Land Use & Ecology	4	10	40%	0.10	4.00%
Pollution	5	12	42%	0.10	4.17%
Innovation	1	10	10%	0.10	1%
Final BREEAM score				55.87%	
BREEAM Rating				VERY GOOD	
Minimum Standards for BREEAM 'Very Good' rating				Achieved?	
Man 4 – Building User Guide				✓	
Hea 4 - High frequency lighting				✓	
Ene 2 Sub-metering of substantial energy uses				✓	
Wat 1 - Water consumption				✓	

Criteria for Materials in BREEAM International

Mat 1	Materials Specification (major building elements) Option 1: Green Guide Score or Option 2: Other Material Assessments Tools	4
Mat 2	Hard Landscaping and Boundary Protection (Option 1 or 2 as for Mat 1)	1
Mat 3	Re-Use of Facade	1
Mat 4	Re-Use of Structure	1
Mat 5	Responsible Sourcing of Materials (eg recycle content, FSC certified timber)	3
Mat 6	Insulation (LCA and Embodied energy)	2
Mat 7	Designing for Robustness (from traffic)	1

Criterias for Materials in BREEAM International

Mat 1	Materials Specification (major building elements) Option 1: Green Guide Score or Option 2: Other Material Assessments Tools	4
Mat 2	Hard Landscaping and Boundary Protection (Option 1 or 2 as for Mat 1)	1
Mat 3	Re-Use of Facade	1✓
Mat 4	Re-Use of Structure	1✓
Mat 5	Responsible Sourcing of Materials (eg recycle content, FSC certified timber)	3✓
Mat 6	Insulation (LCA and Embodied energy)	2
Mat 7	Designing for Robustness (from traffic)	1

Environmental issues in Green Guide:



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- [Climate change](#)
- [Water extraction](#)
- [Mineral resource extraction](#)
- [Stratospheric ozone depletion](#)
- [Human toxicity](#)
- [Ecotoxicity to Freshwater](#)
- [Ecotoxicity to land](#)
- [Nuclear waste \(higher level\)](#)
- [Waste disposal](#)
- [Fossil fuel depletion](#)
- [Eutrophication](#)
- [Photochemical ozone creation](#)
- [Acidification](#)

Example from Green Guide:

Building type > [Commercial](#)

Category > [Internal Wall](#)

Element type > Masonry Partitions

	Element number	Summary rating
Aircrete blockwork with cement:lime mortar, painted finish only	809180038	A+
Aircrete blockwork with cement:lime mortar, plaster, paint	809180034	A
Aircrete blockwork with cement:lime mortar, plasterboard, paint	809180015	B
Aircrete blockwork with plaster, paint	809180021	A
Aircrete blockwork with thin joint mortar, plaster, paint	809180022	A
Aircrete blockwork with thin joint mortar, plasterboard, paint	809180050	B
Aircrete blockwork, painted finish only	809180037	A+
Aircrete blockwork, plasterboard, paint	809180003	B
Brickwork with cement:lime mortar, plaster, paint	809180033	B
Brickwork with cement:lime mortar, plasterboard, paint	809180016	C
Brickwork with plaster, paint	809180023	B
Brickwork, plasterboard, paint	809180004	C
Dense solid blockwork with cement:lime mortar, painted finish only	809180012	A
Dense solid blockwork with cement:lime mortar, plaster, paint	809180035	B
Dense solid blockwork with cement:lime mortar, plasterboard, paint	809180014	C



Challenges for BREEAM-NOR

Materials Specification (Mat 1, Mat 2 and Mat 6)

Option 1: Green Guide

- complete LCA tool
- environmental data for a large amount of materials
- put materials together to building elements
- seems to have less focus on hazardous substances compared to Norwegian “best practice”
- missing some material combinations common in Norway

BRE: Adaptation of the compliance requirements where necessary:

- National best practice guidance
- Alternative assessment methodologies (e.g. energy/materials)

Option 2: Other Material Assessments Tools

- nationally recognised and endorsed
- appropriate and tailored to the local context and conditions
- there is not one complete Norwegian LCA-tool
- need for more environmental data (EPDs/ generic EPDs)



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Option 2 Other material Assessment tool

1. Use of an Embodied CO2 or Embodied Energy or Carbon Footprinting tool
2. Use of a nationally recognised LCA tool

A national recognised LCA-tool has to fullfill as a minimum:



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- A. At least 3 environmental indicators including Climate Change (indicators may be weighted to provide an overall score)
- B. It addresses the whole life of the building, including service life and disposal.
- C. It is based on LCA principles as set out in the following International Standards:
 - ISO 14040 2006 Environmental Management –LCA- Principles & Framework
 - ISO 14044 2006 Environmental Management –LCA- Requirements and guidelines
 - ISO 14025 2006 Environmental labels and declarations – Type III environmental declarations – Principles and procedures
 - ISO 21930 2006 Building construction – Sustainability in building construction – Environmental declaration of building products.



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	Nordic/EU Ecolabel	ECOproduct	Klimagass- regnskap.no	Calculus	EPD Not a tool
A. At least 3 environmental indicators including Climate Change	?	x	No	No	x
B. Life cycle approach	x	x	Partly	Partly	x
ISO 14040 – LCA principles and Framework	?	x	x	x	x
14044- LCA Requirements and guidelines	?	x	x	x	x
14025 – Environmental labels and declarations	No, but 14024	x	x	x	x
21930 - Environmental declaration of building products.	No, but 14024	x	No	No	x
Kommentar			Carbon Foot Printing Tool	Carbon Foot Printing Tool	

Environmental issues in Green Guide vs ECOproduct:



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- [Climate change](#)
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- Green Guide

ECOproduct

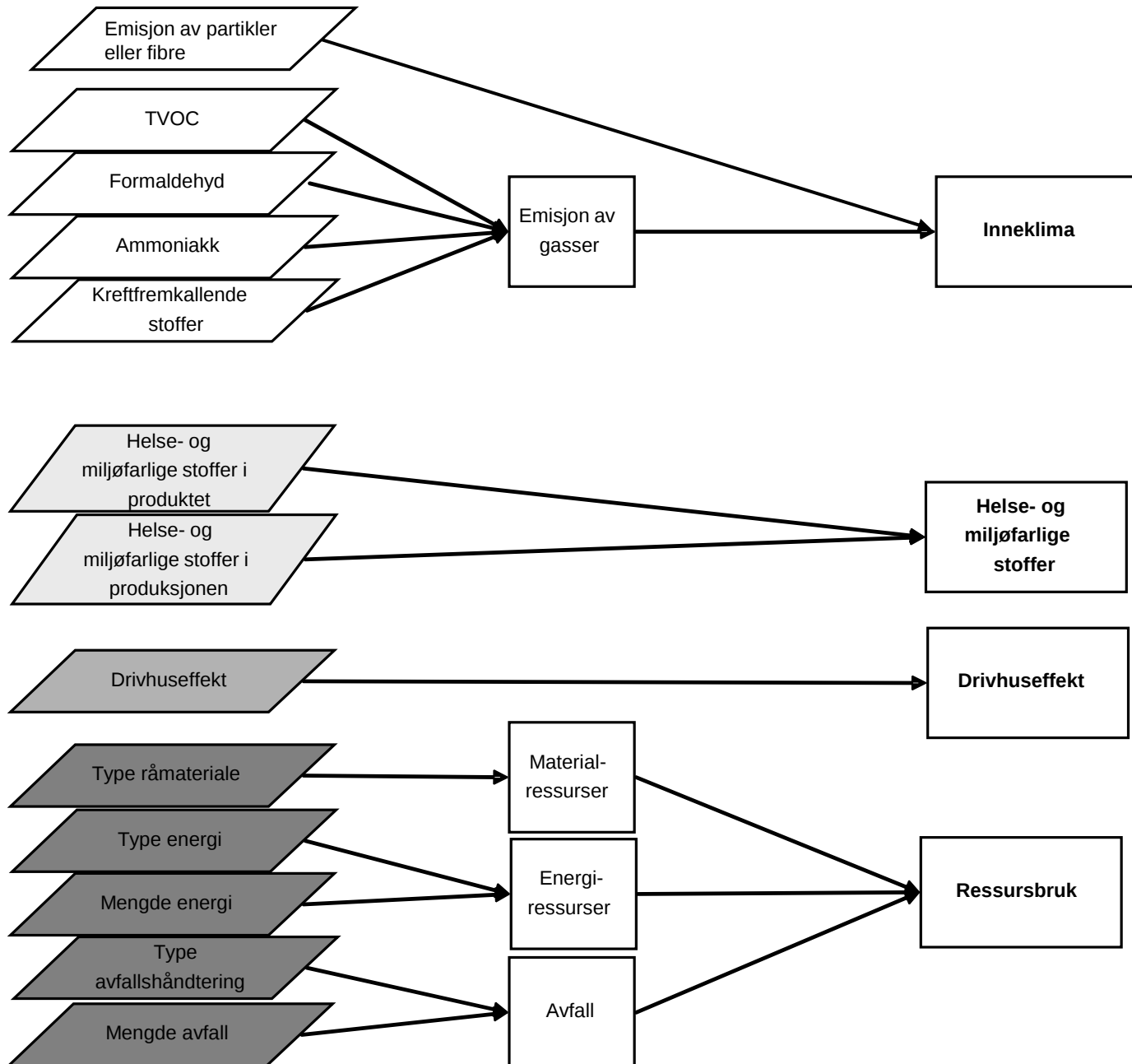
Example: Results of an evaluation based on an EPD:

Indoor Air Quality Emission of gases Emission of particles	2 2	
Hazardous Substances Substances as a part of the product Substances used in production	2 1	
Use of Resources Raw materials Energy Waste	4 6 6	
Carbon Foot Print	7	

Parametere

Nivå 2

Nivå 1



ECOproduct parametre vs BREEAM parametre

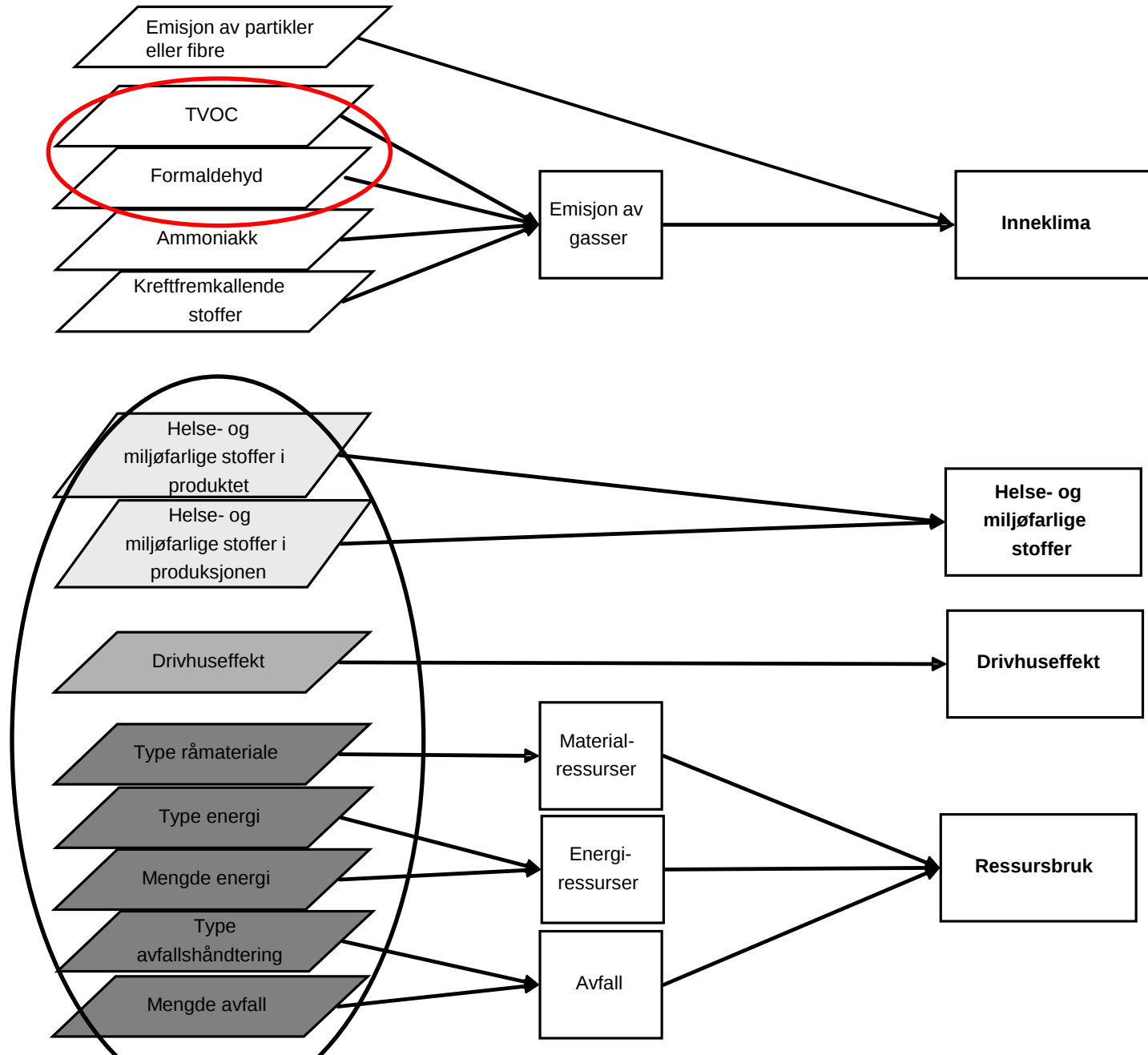


Table 4 Minimum BREEAM standards

BREEAM issue	BREEAM Rating / Minimum number of credits				
	PASS	GOOD	VERY GOOD	EXCELLENT	OUTSTANDING
Man 1 - Commissioning	-	-	-	1	2
Man 3 - Construction site impacts	-	-	-	1	2
Man 4 - Building user guide	-	1	1	1	1
Hea 4 - High frequency lighting	1	1	1	1	1
Ene 1 - Energy Efficiency	-	-	-	6	10
Ene 2 - Sub-metering of substantial energy uses	-	-	1	1	1
Ene 5 - Low or zero carbon technologies	-	-	-	1	1
Wat 1 - Water consumption	-	-	1	1	2
Wat 2 - Water meter	-	-	-	1	1
Wst 3 - Storage of recyclable waste	-	-	-	1	1
LE 4 - Impact on site ecology	-	-	-	2	2



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Norwegian strategy

- BREEAM NOR ver.1,0 – sept 2011
 - Get credits by using different Norwegian tools
- BREEAM NOR ver.2,0 – 2012/2013?
 - A Norwegian complete «Green Guide»?
 - A Nordic «Green Guide»?
 - Still use a mixture of Norwegian existing tools?